XXIII.—*Bird-notes in two Andalucian Sierras.*

By Captain H. Lynes, R.N., M.B.O.U.

During the spring of 1910 the authors of 'Unexplored Spain,' Mr. Walter Buck and Mr. Abel Chapman, very kindly invited me to accompany them on some of their expeditions into the sierras of southern Andalucia.

Readers of that charming book will have found much of novelty and interest therein concerning the ornithology of these sierras, and the authors agree with me in thinking that a few of the purely ornithological results of the expeditions, necessarily excluded from a book of so wide a scope as 'Unexplored Spain,' may be of interest to readers of 'The Ibis.'

The following notes concern:—

(*a*) San Cristobal,* the dominant mass of the Serrania de Ronda, a small sierra about forty miles north of Gibraltar.

(*b*) A spur of the Sierra Nevada between Granada and the Picacho de la Veleta, bordering the upper waters of the River Monachil.

The admirable descriptions in 'Unexplored Spain' render detail as to the features of these regions unnecessary, but for the benefit of those who have not yet read the book, the following general outlines may here be given.

San Cristobal.

San Cristobal is a very distinctive mass of limestone crags of similar geological formation to the more familiar country

* To be quite accurate, it should perhaps be stated that the name of this mountain in all Spanish maps is the "Sierra del Pinar," the title "San Cristobal" applying only to one of its loftiest and most precipitous peaks—the "Cumbre de San Cristobal," impending almost directly above Grazalema. Further, it may be added that in itself the Spanish name is wrong, since it ought to be "Sierra del Pinsapal" (*vice* Pinar).

The height of San Cristobal is given in Artero's Atlas (Barcelona, 1908) as nearly 2400 metres. It is, however, rather less than 6000 feet, and the highest point we passed in 1910 appeared, by aneroid, to be approximately 5400 feet.—A. C.

in the neighbourhood of Gibraltar; but, rising head and shoulders above the surrounding peaks and ridges of its own sierra, it has no rival in altitude in that part of Spain save to the south-east and where the Sierra de las Nieves and the Sierra Bermeja terminate the great coastal mountain-chain that stretches from Cape de Gata almost to the "Rock."

From even so low a point as 1000 feet below its summit, there is a glorious view of the Mediterranean and Straits of Gibraltar, backed by the Atlas Mountains, a vista wherein the "Rock," though viewed across the tops of some forty miles of rugged limestone crags and precipices, hills and dales with scarce a visible sign of human habitation, appears a prominent feature of the middle distance.

Roughly speaking, San Cristobal is in "plan" an oval, the longer axis lying approximately east and west. Its northern side is nearly all precipice and talus, and might be described as "15° where it isn't perpendicular." Its upper regions (about 3500–5000 ft.) form, nevertheless, the site of a forest of Pinsápo pines (*Abies pinsapo*)—rapidly, alas, diminishing under the influence of axe and avalanche. This remarkable species of pine is unknown to exist elsewhere on earth, save here and on the northern faces of two adjacent sierras.

Lower down, on the northern face, the upper trees mingling with the lowest pinsápos, is a zone of scattered groves of ilex and wild olive-trees extending more or less down to the base.

The other sides are chiefly steep slopes with stones and boulders innumerable and smaller crags here and there. Wherever the soil is sufficient, scrub is to be found; at the base flourishing with all the wealth of the Andalucian "monte"* but diminishing in kind and luxuriance to the upper regions, where the few species assume a stunted, hard and prickly growth, opposed to everything but the maintenance of their own existence.

Spurs run out from the north and east faces at about 3000 and 1000 ft. respectively, connecting it with the other

* *Lit.*, brushwood.

ridges and peaks of its sierra, otherwise San Cristobal rises "solo" from elevations of about 1500 ft. at its western, to 2500 ft. at its eastern end.

Such is the "San Cristobal" of this paper, the object of which is to treat of altitudes which have received but scant attention from the pens of ornithologists as compared to the plains, marismas, woods, and hills of the lowlands. But for the purposes of comparison mention will occasionally have to be made of the surrounding country (so far as the writer's personal acquaintance goes, that lying between Jerez and Ronda), so that a few words concerning it will not be amiss.

In the Jerez direction, *i. e.* to the westward, the aspect is that of a series of ridges and groups of hills diminishing in altitude from about 2000 to 1000 ft. and becoming more and more undulating, less steep and craggy, until at about twenty-five miles the low rolling hills and, finally, the plains and marismas stretch out for the last twenty miles to meet the Atlantic seaboard.

The latter zone it is proposed in this paper to style the "lowland."

The former zone, which it is proposed to style the "foothills," is a country of confined and fairly well watered valleys: of upland stretches, pleasantly clothed with cork and ilex trees wherever the carbonero's hand has not been too free; and of scrub-clad hillsides, with groves of ilex ("encina") and the deciduous Spanish oaks ("roble") here and there.

Many of these hills and ridges are crowned with crags or with piles of huge boulders; sometimes a stream, in the course of ages, has eaten its way through a limestone ridge and flanked its course by a series of perpendicular walls; while here and there a precipice concealed among the folds of the hills affords a surprise to the wayfarer by suddenly appearing above him as he rounds a corner; and it is to such "features" as these that the "foothills" owe most of their ornithological wealth, or at any rate their chief interest: here are to be found the Vultures, Golden and Bonelli's Eagles, Eagle-Owls, the colonies of House- and Crag-Martins, Blue Rock-Thrushes, Black Wheatears, &c., &c. Similar features,

but on a smaller scale and at greater intervals, are reproduced in the "lowlands."

From San Cristobal in the Ronda direction, *i.e.* to the eastward, it is much the same sort of country—"foothills"; but, as might be expected from its approach towards the sierras of the Province of Malaga, the ground-level is higher, being about 2500 ft. above sea-level.

Sierra Nevada.

Though we may be able to take a fairly comprehensive survey of the bird-life on a single mountain like San Cristobal, the undertaking becomes obviously far more difficult over a vast mountain-mass such as the Sierra Nevada, of tenfold greater area and double the elevation, especially as our experience embraced but a comparatively small corner at the west end of the range.

The following paragraphs summarize our impressions of its physical features compared with those of San Cristobal; but the reader will please to note that these apply only to the particular part of the Sierra Nevada specified :—

(1) The precipitous and rugged parts are proportionately fewer "per area," but may often, as in the case of the terrific precipices that introduce the Monachil into the Vega of Granada, be on a very much larger scale.

(2) The geological formation differs, in that most of the first two thousand feet immediately above the Vega, consists of what seemed to us to be shale and clay or loëss, wretchedly poor and uninteresting in both plant and animal life.

(3) The succeeding zone, 4500–6500 ft., is much more like San Cristobal, rocks and boulders in fantastic profusion, fairly well clothed with scrub and bushes, and in some parts with pines (*Pinus pinaster*) and a few ilex trees.

(4) Above this zone, stretching upwards apparently to the Picacho de Veleta itself, lie miles and miles of moorland slopes, broken only at long intervals by

collections of crags or boulders, one of the largest of which—the Peñones de San Francisco—at 8500 ft. formed the furthest point of our explorations.

Replace the short esparto grass by coarse bents, and the occasional starveling growth of flattened juniper bushes by bog-myrtle, and these upland stretches might almost be mistaken for parts of the higher moorlands of North Wales.

For brevity of reference, these three zones will hereafter be termed the lower, middle, and upper zones respectively.

The periods of our visit to the two sierras were as follows:—

San Cristobal.—21st to 26th March and 22nd to 26th April.

Sierra Nevada.—28th April to 3rd May, during which time snow still covered north-facing slopes from seven, and south-facing slopes from eight thousand feet upwards, while down to six thousand feet vegetation and soil alike shewed unmistakable evidences of their recent release from winter's mantle.

It is perhaps needless to say that in such flying visits much must have escaped our notice, or that observations made in one small corner of a great expanse of mountain-ranges like the Sierra Nevada do not necessarily hold good all over its area; on the contrary, it was very evident to us that there is still much to be learnt in both regions concerning their birds.

Speaking in general terms, each sierra, though in the main similar, seemed to have much ornithological character of its own.

The Sierra Nevada, in the wild expanses of its upper zone, maintained as breeding species the Alpine Accentor, and apparently also the Skylark, Common Wheatear and others that require for the purposes of reproduction a more temperate climate than San Cristobal's lesser altitude can offer, but apart from this the latter certainly gave us the impression of being far the richer in bird-life; most of what was to be seen in a long day's exploration in our part of the Sierra Nevada

would probably have been seen in a few hours on San Cristobal. This is, moreover, quite in keeping with what has already been said about the comparative scale of the two districts.

It was also remarkable that in the Sierra Nevada, the corresponding bird- and plant-life seemed to be reproduced at an additional 1500 or 2000 ft. elevation ; thus it was not until the middle zone was reached that San Cristobal's 3000 ft. life became general.

Some aspects of the ornithology of these sierras, which though not new, gain much in interest by coming under personal observation, and provide matter for reflection on general subjects, such as geographical distribution, &c., are :—

(1) The ready adaptation to the climates of altitudes up to 4000 ft. or more of such species as the Dartford Warbler, Woodlark, Hoopoe, and others, which also breed at sea-level comparatively close to the base of the sierras provided the environment, and presumably food, are suitable to their requirements for reproduction, although in many parts of the intervening zones there may be no such suitable environment.

(2) The presence and (apparent) breeding of such species as the Common Wheatear and Skylark at high altitudes which furnish them with a climate resembling that which other individuals, of the same species, find at sea-level thousands of miles further north.

(3) The little use that migrating birds seem to make of the sierras as a resting-place during their passage ; for instance Chats, Warblers, and Flycatchers of many species passed abundantly through the foothills and lowlands of the Province of Jerez during March and April but were almost entirely absent from San Cristobal, and yet the latter must lie in the direct route of many of the birds. It is presumably the altitude that is objected to, if not for flighting, certainly for alighting purposes.

A few words as to ways and means for the benefit of those who would make further investigations in these parts. In the Sierra Nevada explorations of any magnitude cannot be undertaken without considerable preparation and forethought: its chief ornithological treasures lie remote from roads and even the smallest "ventorillos." Our own researches were carried out from a substantial farm-house at 6000 ft., accommodation in which we owe to the kind introduction of the late Mr. Davenhill, H.B.M.'s Vice-Consul at Granada.

With San Cristobal, however, it is quite a different thing. A few hours by rail and plentifully supplied with hotels and fondas, Ronda is the most convenient starting-point. Here mules can be hired for the transport of baggage, and the "caballero" himself can either walk or ride the 15 miles of charming and varied country to the village of Grazalema, which lies at the base of San Cristobal itself. Grazalema has a capital little "posada," from which daily expeditions about the sierra can be made, or if one is prepared to rough it in a mild way, remembering that the nights even at the end of April are often bitterly cold, a camp can be established, preferably among the pinsapos. There are plenty of springs of water alive at this time of the year. Such an expedition is well within the scope of a few weeks' absence from England or a single week from Gibraltar, and apart from the mere pleasure of the outing, is one which can scarcely fail to prove satisfactory to the ornithologist. The cost will be little more than the travelling expenses, for at Grazalema one lives for a few pesetas a day.

In the following list the nomenclature is given according to the "Rules of the International Commission on Zoological Nomenclature." It has been thought best to treat the birds of which no specimens were brought home binomially, as the subspecies to which they may have belonged cannot be definitely ascertained without specimens. It was not found possible to collect specimens of many of the "resident" birds and this was still more unfortunate,

since many of the Spanish "residents" are little known in collections. Species of which examples were obtained are marked with an asterisk *; these have kindly been identified by Mr. H. F. Witherby, to whom, as well as to Mr. Abel Chapman, the writer's best thanks are due for help in the preparation of this paper.

Altitudes are "above sea-level" and approximate; the majority were taken with a pocket aneroid.

Corvus corax. Raven.

San Cristobal.—We were rather surprised not to meet with the Raven at all in San Cristobal, since the species was plentiful in the foothills and lowlands.

Sierra Nevada.—One or two Ravens were seen on the wing at 4500 ft., but none higher.

Garrulus glandarius. Jay.

San Cristobal.—The Jay was met with in the lower pinsapo region, where those trees were interspersed with ilex, but the bird was much more plentiful in the cork woods of the foothills.

*Pyrrhocorax pyrrhocorax (L.), nec auct. Chough.

San Cristobal.—The Red-billed Chough was plentiful and breeding in suitable precipitous crags from the base of the mountain up to 1000 ft. Nuptial flights, the birds shooting downwards at a prodigious pace with wings almost closed, were being carried out during the last week of March, while a month later, nests in inaccessible holes and crevices probably contained fresh eggs, judging from the frequent noisy coming and going of the owners without food or nesting materials.

Sierra Nevada.—Here again the Red-billed Chough was the only kind observed. Flocks occurred up to quite 7000 ft., and may very likely have had a home at that altitude in the Genil valley, but the only nesting-colonies seen were considerably lower down in the precipices at the embouchure of the Monachil.

Chloris chloris. Greenfinch.

San Cristobal.—A trilling note, almost certainly that of the Greenfinch, was often heard in the pinsapal in March. Its author systematically eluded observation, and we did not hear the note during our April visit.

Sierra Nevada.—Not observed in the Sierra, but evidently breeding in the gardens at Granada.

Carduelis carduelis. Goldfinch.

San Cristobal.—The Goldfinch was observed much higher than the base of the mountain.

Sierra Nevada.—Plentiful in the bush-country of the middle zone.

Carduelis cannabina. Linnet.

San Cristobal.—A few Linnets bred in the foothills and lowlands, but the species was not observed on the mountain.

Sierra Nevada.—Plentiful and evidently breeding in the bush-country of the middle zone, where males were singing during our visit.

* Serinus canarius serinus (L.). Serin.

San Cristobal.—The Serin was observed much higher than the base of the mountain.

Sierra Nevada.—Plentiful in the bush-country of the middle zone.

Fringilla cœlebs. Chaffinch.

San Cristobal.—The Chaffinch, although abundant in the woodlands of the foothills, was only observed near the base of the mountain.

Sierra Nevada.—Fairly plentiful, singing and presumably breeding up to quite 6000 ft. Numbers were feeding in company with Linnets and Rock-Sparrows on the ploughs and fallows at 7000 ft., at which altitude the melting of the snow had just given sufficient time for the ground to be brought under cultivation.

We saw nothing of the Snow-Finch—the Peñones was our highest altitude.

* Petronia petronia (L.). Rock-Sparrow.

San Cristobal.—A colony of Rock-Sparrows was established alongside a large "Choughery" at 2500 ft., and nest-building was in progress there on April 26th. The species was not found anywhere else in the Serrania de Ronda.

Sierra Nevada.—A few were nesting in the pot-holes in the face of a perpendicular crag, overhanging the Monachil at 6000 ft. During the ascent to the "Peñones" on May 1st, numbers of Rock-Sparrows were seen feeding on the ploughs and fallows at 7000 ft., and on being disturbed they made a short flight and re-alighted, uttering Lark-like cries. One or two examples were seen not far above Granada, but apparently only out foraging.

Passer domesticus. House-Sparrow.

Our observations on the House-Sparrow were incomplete. The Spanish Sparrow was not seen at all.

Emberiza calandra. Corn-Bunting.

The Corn-Bunting was not met with out of the lowlands.

Emberiza cirlus. Cirl Bunting.

San Cristobal.—The Cirl Bunting was breeding up to 3500 ft. on the mountain, but the foothills were evidently its principal habitat.

Sierra Nevada.—Several pairs were evidently breeding in scrub-clad parts of the middle zone.

* Emberiza hortulana. Ortolan Bunting.

San Cristobal.—The Ortolan was not observed. Possibly we left just before the date of its arrival.

Sierra Nevada.—A few were seen, just above the tree-limit at 7000 ft. on May 1st; a male which was singing alongside its mate, had the testes half size only.

* Emberiza cia. Rock-Bunting.

San Cristobal.—The Rock-Bunting (which name seems so much more suitable than the "Meadow-Bunting" of some authors) was breeding in some numbers at the end of

April, on the barer and more stony slopes between 2500 and 3500 ft., a somewhat narrow zone. Unlike the Cirl, the Rock-Bunting was never seen in the "foothills."

Sierra Nevada.—Plentiful and evidently breeding in the middle zone, as well as on the very steep stony slopes near the embouchure of the Monachil.

Speaking in general terms, this species might be described as a bird of the middle and more stony slopes of these Sierras, where the scrub is comparatively short and scanty, the latter considerations being of greater importance than the altitude; while the Cirl Bunting inhabits the richer scrub and bush-country ("monte") of the foothills, but also extends to considerable altitudes in the sierras, where the environment is suitable.

* Calandrella brachydactyla brachydactyla (Leisl.). Short-toed Lark.

On April 28th a party of ten birds was seen on the slopes near the base of the lower zone of the Sierra Nevada, but the Short-toed Lark is essentially a species of the lowlands.

These individuals may have been late arrivals from the south, but it is in keeping with the impression that we received of this zone, viz., that so far as bird-life and environment were concerned, the "Sierra" did not really begin until the "middle zone" was reached.

[I may here refer to a specimen of *Calandrella minor apetzii* (=*bætica*, see Vög. pal F. (i. p. xxv. footnote 2)) in juvenile plumage, procured on May 15th, 1910, in the Coto Doñana. In comparing this with a specimen of *Calandrella brachydactyla brachydactyla* in similar plumage, also collected by Lynes at Algeciras, Spain, on July 15th, 1906, I note the following differences:—The *C. m. apetzii* is dark brown on the upper parts, not yellowish-brown as in the *C. b. brachydactyla*, and the feathers have white, not yellowish, tips, and these tips form a more even fringe, and not a series of spots as in the juvenile *C. b. brachydactyla*. The whole of the under parts are heavily spotted with sooty-brown, whereas in the *C. b. brachydactyla* only the breast is

spotted, the throat and belly being white. These differences are of some importance for identification, because in the juvenile *C. b. brachydactyla* the secondaries, although apparently fully grown, are considerably shorter than the primaries, as they are in members of the *minor* group, whereas in adult *brachydactyla* they are as long as the primaries.—*H. F. W.*]

* Galerida thecklæ thecklæ Brehm.
* Galerida cristata pallida Brehm. } Crested Larks.

San Cristobal.—A few Crested Larks were breeding on esparto-grass slopes and plateaux of the mountain up to 4000 ft., at which elevation a female shot on April 24th was in the middle of her egg-laying. In the Coto Doñana the species was very scarce, but everywhere between that place and San Cristobal, especially in the undulations of the lowlands, abundant.

Twelve specimens from localities representative of the whole of this distribution shew a certain amount of variation in colour, nevertheless they all undoubtedly belong to the "*thecklæ*" group.

We have a suspicion that in the plains round Jerez there are a few *G. cristata*, more sandy-coloured birds than any of the above and, in marked contrast to the latter, so wild that we could never shoot one to settle the question.

It may be mentioned that near Hervas, in Estremadura, we procured both *G. thecklæ* and *G. cristata* alongside one another, and, moreover, the latter was sufficiently distinctive in appearance to cause us to dismount on purpose to obtain what was obviously a different bird to *G. thecklæ*, of which we had just shot four specimens.

A point of interest, which others may perhaps have noticed in the Crested Lark, is the frequency with which during the breeding-season three birds are seen together. Earlier in the year, when courting is in progress, there would of course be nothing remarkable about such an occurrence, but we rather think the Crested Lark may be inclined to irregularity in its mating, a suggestion in support of which may be

recorded in the finding of a nest with eight eggs on May 7th. Five of these were blotched and about four days set, while three were spotted and about six days set, so that they had obviously been laid by different birds. The sitting female, which was shot as she left the nest, had no more fertile eggs in her ovary. Unfortunately, lack of time prevented further investigation of this interesting case.

Sierra Nevada.—Seen up to 4500 ft., but no higher; apparently all *G. theklæ*, but no specimens were obtained.

[I have made a careful examination of the series of specimens of *G. t. theklæ* collected, and find that the differences in colouring (which are slight) can only be attributed to individual variation. One bird, obtained on June 9th, 1910, near Granadilla, Estremadura, is particularly brown, especially when compared with three greyish-black birds from the Coto Doñana; two others from Estremadura are brownish, but others are much like the Coto Doñana birds; from near Jerez there are both greyish-black and brownish specimens, and the same may be said of those from near Chipepe. The specimen mentioned above as belonging to the "*cristata*" group from Hervas, Estremadura, is an example of *Galerida cristata pallida*.—*H. F. W.*]

Lullula arborea. Woodlark.

San Cristobal.—The Woodlark impressed us with its mixed ideas as regards "habitat"; a fair number bred in wooded parts of the Coto Doñana at sea-level (young hatched May 4th), many in the woods of the foothills and lower zone of the mountain, while others frequented some bare esparto-grass patches at 4000 ft., where they were courting at the end of March, and evidently had eggs or young in the nest on April 23rd.

The last locality had probably been denuded of its scrub and trees at no very remote date, and the apparent inconsistency of these individuals in nesting in so exposed a place may be but an instance of hereditary attachment to old nesting-sites of former scrub- and tree-clad days, such as are mentioned in "Yarrell" in the case of the Stone-Curlew,

where those birds still continued to breed in spite of their old haunts having been transformed into plantations.

Sierra Nevada.—A pair of fledged young were out of the nest at 4000 ft., on April 28th, and the species was also breeding here and there (males still singing on May 3rd) in the middle zone, chiefly in the vicinity of small ilex trees and dwarf oak.

Alauda arvensis. Skylark.

San Cristobal.—The Skylark was not observed. Migrants and winter visitors seen in the lowlands during April had all departed by the middle of the month.

Sierra Nevada.—Very much as in the case of the Common Wheatear, Skylarks were met with as low as 4500 ft., where they behaved as if on passage; but on the pastures and slopes above 6000 ft., and especially on the esparto-grass stretches between 6500 and 7500 ft., from which the snow had but recently melted, there was every indication that many intended to breed. Some were in full song high in air, others only in partial song, while many were obviously paired, with sexual organs largely developed, shewing that laying might be expected to commence about mid-May.

*Anthus campestris campestris (L.). Tawny Pipit.

San Cristobal.—The Tawny Pipit, whose first appearance for the year seemed to be about April 7th in the lowlands, was established for breeding in moderate numbers on the stony slopes and esparto-grass plateaux up to 4500 ft. A male (paired) shot on April 24th had the sexual organs half size only.

Sierra Nevada.—Plentiful on the stony sarsaparilla-clad slopes of the "lower zone"; on April 28th and 29th males were singing while descending in aerial spirals exactly after the manner of the Tree-Pipit, and nesting was evidently in progress.

A few individuals probably breed in the lowlands, as occasional examples were seen in the low hills bordering the plains near Jerez on May 30th and June 2nd.

[Two males collected on April 13th and 15th have both

evidently just completed their moult, but whereas one appears to have the two central tail-feathers new and also perhaps some secondaries, the other has these feathers much worn.—*H. F. W.*]

Anthus pratensis. Meadow-Pipit.

Anthus trivialis. Tree-Pipit.

Neither Meadow- nor Tree-Pipits were met with in the Sierras. Our visits were probably too late to expect the former, as Mediterranean winterers make an early move north, and the latter was only observed on passage through the lowlands during the first half of April.

Motacilla boarula. Grey Wagtail.

San Cristobal.—On March 22nd a single male in almost complete summer plumage was seen at the base of the mountain. This may have been a breeding bird, but during the summer the upper waters cannot be sufficient for breeding purposes.

[N.B.—I found two nests in the Sierra de Jerez (about 3000 ft.) on April 19th and 22nd in a former year.—*A. C.*]

Sierra Nevada.—In the valleys of the Monachil and its tributary burns in the "middle zone" the Grey Wagtail was quite plentiful. Nests were found building and nearly ready for eggs.

* Certhia brachydactyla ultramontana Hart. Tree-Creeper.

San Cristobal.—The Tree-Creeper was plentiful among the pinsapos, where a pair were seen completing their nest in a very rotten tree at 4800 ft. It was also met with in the cork woods of the foothills, but was unknown in the Coto Doñana.

[A female specimen procured at San Cristobal on April 29th, 1910, compares well with the type of this form.—*H. F. W.*]

Sierra Nevada.—Not met with and not likely to exist in our district, the tree-growth being either too small or too young.

Parus major. Great Titmouse.

The Great Tit was met with from sea-level to well up San Cristobal and up to over 6000 ft. in the Sierra Nevada, equally at home throughout this great range in altitude.

* Parus cæruleus. Blue Titmouse.

Our notes on the Blue Tit are somewhat incomplete. In San Cristobal the species did not seem to frequent the pinsapo forest, but was plentiful in the woods on the lower slopes of the mountain and among the foothills. In the Sierra Nevada it was plentiful in the middle zone.

[One specimen (female, May 2nd, 1910, Sierra Nevada) was brought home. This example is in much-worn plumage. The mantle is brownish-grey, not so green as an equally-worn specimen of *P. c. obscurus*, but the rump is green like that of *P. c. obscurus*. The under parts are of a brighter yellow than those of *P. c. obscurus*, and more like those of *P. c. cæruleus*, but the specimen is too much worn for proper comparison.—*H. F. W.*]

* Parus ater vieiræ Nicholson. Peninsula Coal-Tit.

Parus vieiræ Nicholson, Mem. & Proc. Manchester Lit. & Phil. Soc. l. iii. No. 13, p. 16 (1906—Portugal).

San Cristobal.—The Coal-Tit was plentiful and apparently strictly limited to the pinsapo forest. A pair obtained on April 23rd had the sexual organs but slightly advanced. At this date they were always seen in twos (presumably pairs), but nesting did not seem to have commenced. On April 25th, as we sat among the higher pinsapos at 4800 ft., a pair came up to look at us, one very noisy, the other with inquisitive concern hopping down an outstretched bough to within a few feet of us. We searched high and low for a nest, without success; probably there was not one, for the birds, unmolested, took themselves off when their curiosity was satisfied.

For the most part the birds were busily engaged in prising off the tender red buds of the pinsapo in search of insects.

Sierra Nevada.—In the pine trees of the middle zone the species seemed plentiful; the sexual organs of a male shot

from a pair on April 30th indicated that nesting was only in the preparatory stages.

[Two males and one female were collected at San Cristobal in April, and one male in the same month in the Sierra Nevada. These specimens are intermediate between *P. a. ater* and *P. a. britannicus*. The colouring of the mantle is not so pure a grey as in *P. a. ater*, nor so olive as in *P. a. britannicus*, but the rump is decidedly olive-brown as in the latter, and the flanks and axillaries are more golden-buff than in the typical form, and thus like those of *P. a. britannicus*. The wings measure: ♂ ♂ ♂, 61, 63, 65; ♀, 62 mm.; they are quite as long as in *P. a. ater*, and longer than in *P. a. britannicus*. The bills equal those of *P. a. ater*, which are usually longer than in *P. a. britannicus*. The single specimen upon which Mr. Nicholson based his "*vieiræ*" was no doubt an aberrant example.—*H. F. W.*]

* Ægithalus caudatus irbii (Sharpe & Dresser). Spanish Long-tailed Tit.

The Spanish Long-tailed Tit was met with in the foothills, and was very likely overlooked in the woods on the lower slopes of San Cristobal, which appeared quite suitable for it.

This species was not seen in the Sierra Nevada.

* Regulus ignicapillus ignicapillus (Temm.). Fire-crest.

San Cristobal.—The Fire-crest was seen up to 4500 ft. in the pinsapo forest, as well as among the woods of the foothills. None were observed in the Sierra Nevada.

Lanius senator. Woodchat Shrike.

We were surprised to see a Woodchat in some ilex trees at 6500 ft. in the Sierra Nevada on April 30th, but the species is of course ordinarily a bird of much lower altitudes.

Muscicapa hypoleuca. Pied Flycatcher.

San Cristobal.—A single male Pied Flycatcher on migration was obtained in the pinsapal at 4800 ft. on April 23rd; testes still quite small.

Sierra Nevada.—A single male was seen in a retired corner of the Monachil valley at 5000 ft., also evidently migrating.

The normal passage, *viâ* the lowlands, took place between early April and the end of May.

* Phylloscopus trochilus trochilus (L.). Willow-Warbler.

Phylloscopus collybita. Chiffchaff.

Neither the Willow-Warbler nor Chiffchaff in their respective seasons seemed to frequent altitudes greater than 2500 ft.

* Phylloscopus bonellii bonellii (Vieill.). Bonelli's Warbler.

San Cristobal.—A Bonelli's Warbler was seen in a bleak spot at 4000 ft. on April 23rd, evidently on passage; we were probably too early to make observations as to breeding.

Sierra Nevada.—On April 29th, at 5000 ft., a male with testes of half-size was shot, and on May 3rd the song proclaimed that the species would probably breed in the bush and pine-tree parts of the "middle zone."

Cettia cetti. Cetti's Warbler.

On 22nd March we were surprised to hear the strident babble of a Cetti's Warbler in an oleander thicket at 1500 ft., at the base of San Cristobal. Otherwise we only met with the species in the lowlands, where it breeds plentifully, if somewhat locally.

* Hypolais polyglotta (Vieill.). Melodious Warbler.

Hypolais pallida opaca Cab. Olivaceous Warbler.

Neither the Melodious nor Olivaceous Warblers, both species abundant summer visitors to the lowlands, were observed in the Sierras.

Sylvia borin. Garden Warbler.

Sylvia hortensis, nec auct. Orphean Warbler.

Both the Garden and Orphean Warbler were only met

with in the lowlands, the former apparently as a migrant only, passing between mid-March and mid-May, though a single male singing on May 7th may have been a breeding bird : the latter as a summer visitor.

Sylvia atricapilla. Blackcap.

Like the Sardinian Warbler, though differing in being mainly a summer visitor, the Blackcap does not affect the Sierras. We found it breeding up to the extreme base of both Sierras, but no higher. Great numbers northward bound also passed through the lowlands during March, males and females at the same time, but as a rule the parties were composed of one sex only.

Sylvia communis. Common Whitethroat.

Andalucia is presumably one of the Whitethroat's most southerly breeding habitats, so that one would hardly expect to find the species nesting in any quantity. A pair seen on April 22nd, and again at the same place on the 26th, by their actions were certainly breeding at the base of San Cristobal (2500 ft.), as were two examples seen in the Sierra Nevada at 4500 ft. and 6000 ft. respectively.

In the lowlands a few birds, probably also breeding, were seen in May. Many had passed through on migration during the first three weeks of April.

Sylvia melanocephala. Sardinian Warbler.

The Sardinian Warbler is not really a Sierran bird ; on San Cristobal 3000 ft. was the highest range noted, and the species was not met with at all in the Sierra Nevada.

* Sylvia cantillans cantillans (Pall.). Subalpine Warbler.

The Subalpine Warbler was not met with in the Sierras, and was scarce even in the lowlands, which seems curious, since it is quite a plentiful breeding species near Huelva and the lower Guadiana.

Sylvia conspicillata. Spectacled Warbler.

In the Sierras, as in the lower ground, the Spectacled Warbler is a very local bird; for instance, there were three different pairs breeding (apparently with young on April 24th) in a fifty-acre patch of undulating stony soil, scantily clothed with scrub, at 3000 ft. on San Cristobal, and these, with one exception, were the only representatives of the species seen by us during the whole season.

Sylvia undata. Dartford Warbler.

The Dartford Warbler in Andalucia, as well as in other parts of the Mediterranean area, seems to affect almost exclusively that loose (as opposed to dense) growth of gorse, *Cistus*, "Cantueso" * and other small shrubs which one soon gets to recognise as being a favourite haunt of most of the small warblers in those parts, and in the case of the present species with a somewhat remarkable disregard of altitude. From 4500 ft. on San Cristobal down to the Coto Doñana at sea-level, we found the species breeding where the proper sort of "ground" existed. We did not note the species in the Sierra Nevada.

Agrobates galactotes. Rufous Warbler.

We were too early for the Rufous Warbler at San Cristobal; but during our stay in the Sierra Nevada (April 28th–May 3rd) it began to arrive. On May 3rd a male was singing in the bush and pine-tree district of the middle zone.

Turdus viscivorus. Mistle-Thrush.

San Cristobal.—The Mistle-Thrush was not met with, but several were seen in the cork and ilex woods of the "foothills" just below.

Sierra Nevada.—One or two were seen among some scattered ilex trees at 7000 ft., near the limit of tree-growth.

The species evidently breeds in both the above localities.

* [Cantueso is a kind of wild thyme: quite tall.—*A. C.*]

Turdus philomelus. Song-Thrush.

Turdus musicus auct.

The Song-Thrush was not observed in either Sierra. The last note of the species heard in Andalucia was on April 19th, but this was in the lowlands "foothills."

Turdus torquatus. Ring-Ouzel.

San Cristobal.—A female Ring-Ouzel was seen at 4000 ft. on March 24th, and a male flew by "clucking" not far from the same place, but 800 ft. higher, on April 23rd. Breeding seemed doubtful, although the latter date suggests it.

Sierra Nevada.—On May 1st and 2nd a very wild bird was seen among dwarf juniper recently emerged from the snow at 8000 ft. Here again the lateness of the date suggests breeding, but we have no direct evidence of it.

[If these were breeding birds they would belong to the Alpine race, *Turdus torquatus alpestris* (Brehm).—*H. F. W.*]

Turdus merula. Blackbird.

San Cristobal.—Blackbirds were quite plentiful up to the top of the pinsapo forest. Unfortunately no specimens were obtained, but our impression was that the hen birds of the upper regions lacked the very conspicuous russet hue of those in the "foothills" and "lowlands," and may perhaps be found to belong to a different race. Here is a interesting point for further investigation.

Sierra Nevada.—Not observed above Granada and the Vega; but the species may have been overlooked in the middle zone, where the bush and pine-tree country seemed very suitable.

[The Spanish Blackbird has been described as *Turdus merula hispaniæ* by Kleinschmidt ('Falco,' 1909, p. 22), being separated on account of its shorter wing and longer tail, but hardly enough material seems to have been examined. Two specimens collected by Mr. W. C. Tait in Portugal in May 1911, and kindly given by him to me, are short in the wings but the tails are not long. They measure:—♂. Oporto: wing 123 mm., tail 103 mm.; ♀. Caldas de Gerez: wing 120 mm., tail 97 mm. The female is not so

rufous on the under parts as the typical bird, nor so slate-brown as the Algerian form, *T. m. algirus* (Mad.).—*H. F. W.*]

* Monticola saxatilis (L.). Rock-Thrush.

San Cristobal.—This migratory species had not arrived during our first visit in March : but in April Rock-Thrushes were plentiful, frequenting almost exclusively the rocky stacks from 4000 ft. upwards, where they were obviously about to breed. On April 24th a male was courting, strutting about a flat-topped rock, fluttering his drooping wings in front of a female. At this season the sweet, clear song, uttered either from a stance or whilst in descent describing aerial circles with outspread wings and tail, contributes in no small measure to the charm of the upper regions. On April 25th a pair were shot whose sexual organs indicated that laying might be expected in two or three weeks time, not earlier.

Sierra Nevada.—Plentiful about the rock-stacks of the middle zone, but not present at the very suitable-looking Peñones de San Francisco (8500 ft.), where snow lay in patches on May 1st and 2nd.

The sexual organs of a male shot on May 1st shewed that laying would not take place before the latter part of that month.

[In a previous year I had found a nest with five eggs on May 18th, confirming Lynes's observation as above.—*A. C.*]

Monticola solitarius. Blue Rock-Thrush.

San Cristobal.—Our experience of the (resident) Blue Rock-Thrush was that it kept apart from its more brilliant congener, its chief haunts being the crags and precipices below 3500 ft., while it occurred not only on San Cristobal itself, but in the foothills, where *M. saxatilis* was never seen.

Like most of the resident birds, it is an early breeder; half-built nests were found in March.

Sierra Nevada.—Almost abundant among the stupendous precipices at 4000 to 2500 ft., through which the Monachil descends to the Vega. Comparatively few of these birds

ascend to the higher regions; a male, however, used to sing constantly to his (probably) sitting mate close to our "Cortijo" at 6000 ft. In song and courting this species resembles *M. saxatilis*, and we have also observed the "solitario" singing, with that loose-jointed "butterfly" flight characteristic of *Sylvia* at courting time.

* Œnanthe œnanthe. Wheatear.

San Cristobal.—In our March visit a few Common Wheatears, obviously migrants, were seen on bare grass patches at 4000 ft., but none were observed in April; the elevation and lack of moorland in this Serrania are evidently unsuitable to breeding requirements.

Sierra Nevada.—Wheatears, males predominating, were plentiful in suitable places from 4000 ft. up to the snow-limit; but whereas the birds seen below the upper zone were evidently merely passing migrants—parties seen one day and gone the next—those spread out over the upland slopes between 6600 and 8000 ft. by many indications gave the impression of preparing to nest there.

On the 29th of April the large majority of these were males, but by the 2nd of May a number of females had arrived and were being courted both in song and gesture by the males.

It seemed as if the males, having arrived in advance, had selected their respective territories as soon as they were free of snow, and were now in the process of choosing their partners.

It is worthy of note that a few of the males were in a plumage somewhat resembling that of the autumn. One such specimen, obtained on April 29th, had the testes partially enlarged, but less so than in a full-plumaged male shot the same day.

[Three skins (males, Sierra Nevada, April 29th and 30th, 1910) brought home are very interesting: and it is most unfortunate that it cannot be proved that these birds were actually nesting in the Sierra Nevada, although all Lynes's observations point to the fact that they were breeding birds. The foreheads of these specimens have more white than in

adult typical birds in summer, and their under parts are of a much purer white; their bills are also large, measuring from the nostril to the tip 10, 10, and 11 mm., and from the base to the tip 18, 18, and 19½ mm.; the wings measure 91, 95, and 99 mm. These birds are thus somewhat like those described as *Œ. œ. rostrata* Hempr. & Ehr.

The Common Wheatear has, I believe, never been known to breed in the Peninsula south of the Cantabrian Mountains, and has not before been suspected of breeding in the south of Spain.

The male mentioned as being in a plumage somewhat resembling that of the autumn is in first summer plumage, very distinct from that of the adult. For full descriptions of the various plumages of the Wheatear, see C. B. Ticehurst, Brit. Birds, iii. pp. 391–3.—*H. F. W.*]

* Œnanthe hispanica hispanica (L.). Black-eared Wheatear.

The Black-throated and Black-eared Wheatears were plentiful up to 3000 ft. in both Sierras—in Nevada a sprinkling as high even as 7000 ft.; but their principal habitats were among the lowlands and foothills. Everywhere between Jerez and the Sierra Nevada we found the two species (*pace* Dr. Hartert) remarkably evenly distributed, so that in a day's walk it was a common thing to see each alternately. Nevertheless, and in spite of always being on the look-out for it, we found no evidence contributing to the consideration of the two forms as dimorphisms of the same species. On the contrary, there seemed no more connection between the two species than between, say, Meadow- and Tree-Pipits or Willow- and Wood-Warblers in the parts of our own country where those species intermingle freely.

It is also of note that in Estremadura, on the plains round Trujillo, there was a similar alternation of the two species: but further west, in the hill-country traversed by the River Alagon, there seemed to be only about one Black-eared to ten Black-throated, while in similar country

still further west, viz. the last twenty-five miles of the Guadiana River, Mr. Ratcliff and I, during April and May 1905, found the Black-throated nesting quite plentifully, but never saw a single Black-eared.

A few males of both species in a brown autumn-like plumage were observed during April. The sexual organs of a Black-throated in such a dress, shot at 6000 ft. in the Sierra Nevada on May 1st, and apparently in company with a full-plumaged male of the same species and his mate, were by no means in breeding condition, although the nesting-season of the species was well advanced.

The 1st of May was the latest date that birds in this brown plumage were noted: and I have observed a similar early spring appearance and disappearance of such birds in other parts of the Mediterranean area. Is it possible that these individuals are merely abnormally late in getting into full summer plumage, and on that account will not rear a breed that season?

[Three pairs brought home are very interesting, because Lynes took the utmost pains to make certain that they were actually paired birds. The males are all of the black-throated form. One female has a distinctly blackish throat. Both the other females have black bases to the feathers of the throat, and where the tips of these feathers are worn the black shews through. It may here be remarked that the white-throated form of the male (*i. e.*, the Black-eared Wheatear) sometimes has the feathers of the throat white to the base, and sometimes has them with black bases; and it may be added that the amount of black at the base varies individually. This fact seems a small argument in favour of regarding the two forms as dimorphisms. Lynes's observations are worthy of careful attention, but they do not seem to me to afford absolute proof either way.

Two specimens in the plumage which Lynes refers to as "autumn-like" are undoubtedly in first summer plumage, the difference between this and the adult summer plumage being comparable with the differences observed in the same plumages in the Common Wheatear.—*H. F. W.*]

* (Enanthe leucura leucura (Gm.). Black Wheatear.

San Cristobal.—The Black Wheatear was plentiful from about 2000 to 4000 ft., being especially partial to the crags and masses of detached boulders around Grazalema.

A few pairs were breeding in suitable places among the foothills down to 1000 feet.

Sierra Nevada.—Observed from the Vega up to 4000 ft. wherever the country was sufficiently rugged.

Note.—At Alicante and Cartagena the writer has found the Black Wheatear breeding in stony but otherwise quite "small" country, practically at sea-level, and, as we know, the species breeds on the Rock of Gibraltar; so that, as in the case of the Blue Rock-Thrush, it is evident that the selection of habitat is influenced by environment rather than by altitude.

* Saxicola torquata rubicola (L.). Stonechat.

San Cristobal.—The Stonechat was noted up to 3000 ft. (In the lowlands several broods were on the wing as early as the 31st of March.)

Sierra Nevada.—A sprinkling as high as 5500 ft., at which elevation one was flushed from a nest of four nearly fresh eggs on April 29th; probably a first laying, since a month earlier the site would have been under snow.

The Whinchat was only observed on passage through the "lowlands."

Phœnicurus phœnicurus. Redstart.

Great numbers of Redstarts passed through the "lowlands" on migration between mid-March and the end of April; but the only individual seen in higher altitudes was a single bird at 4500 ft. in the Sierra Nevada on April 29th.

Phœnicurus ochrurus gibraltariensis (Gm.). Black Redstart.

San Cristobal.—Without its Blackstarts, San Cristobal would lose much of the vivacity of its bird-life; in the words of 'Unexplored Spain,' "Blackstarts abounded as Titlarks on a Northumbrian moor."

During the last week of April many nests were found with fresh eggs, one to five in number, between 2700 and 5000 ft. Probably some of the few individuals which had spent the winter in the "lowlands" were responsible for two nests being built on March 23rd, for at this early date courting was the general order of the day. The numbers subsequently increased daily at the breeding zone, as suggested by the arrival of birds obviously on passage through the "foothills" during the preceding days. In breeding, the "Blackstart seemed very faithful to its altitude; many of the craggy tops among the foothills, which appeared to us suitable in every respect, did not hold a single Blackstart."

They rose very early in the morning, and would start singing before any of the other birds, except, perhaps, the Swallow, quite in the dark: it is a sweet Hedge-Sparrow-like song, interlarded with an occasional "scratchy" little warble, like shaking up a bag of cowries, and may be mistaken for the rustling of some creature close alongside.

It seemed that there were occasional males in a plumage intermediate between male and female, but whether these were actual breeders or only "hangers on" for the season, could not be discovered. A difficulty in determining this point was the abundance of the species, nests with eggs being found within a hundred yards of one another.

Sierra Nevada.—Where there were craggy bits the Blackstart was as plentiful as at San Cristobal, from 4000 ft. right up to the Peñones at 8500 ft., but chiefly in the middle zone, where several nests were found. A favourite site for the nest was on a ledge of rock, close to a small torrent, exactly like the spot usually chosen by the Grey Wagtail; indeed, in one instance, where both species were nesting a few yards apart, the sitting birds and eggs were the only signs of distinction.

[I venture to suggest that some male Blackstarts may not attain complete maturity in the first year.—*A. C.*]

Luscinia megarhyncha. The Nightingale.

Though plentiful in the lowlands and valleys of the foothills, the Nightingale is not a bird of the Sierras—yet a male singing in some willows in a sheltered gully in the Sierra Nevada at 4500 ft. indicated that higher altitudes may occasionally be occupied if the environment is suitable.

Dandalus rubecula. Redbreast.

San Cristobal.—The Redbreast was plentiful up to at least 3500 ft., wherever pinsapos and bushes grew, extending downwards to the base and throughout the foothills wherever cork-wood, bushes, and moisture were present.

Sierra Nevada.—Met with among pine-trees and bushes from 6000 ft. down to Granada, where a nest was being built in a garden wall on April 29th.

Prunella collaris. Alpine Accentor.

San Cristobal.—The Serrania evidently does not afford sufficient altitude for the Alpine Accentor's requirements.

Sierra Nevada.—It was not until we reached the Peñones de San Francisco, 8500 ft., half covered with snow on May 1st and 2nd, that the species was found.

Here were three or four individuals, seemingly not yet paired. One sang a sweet Accentor-like song, which changed with alarm to a raucous Sparrow-like chirping. At first, while we watched them with our field-glasses, they were quite tame, but after an unfortunate miss with a collecting-gun, they became very wild, and we were unable to obtain specimens.

Troglodytes troglodytes. Wren.

San Cristobal.—The Wren was found breeding plentifully in the "foothills" and in the woods of the lower slopes of the mountain, but did not seem to extend much above 3000 ft.

Sierra Nevada.—Here the species seemed to affect much higher altitudes, for we came across several right up among the mists and snow at 8000 ft., while a nest (unlined) was found at 5000 ft.

Cinclus cinclus. Dipper.

San Cristobal.—The Serrania de Ronda has probably no perennial streams of suitable size for Dippers. None were seen.

Sierra Nevada.—Plentiful in the upper waters of the Monachil from 6000 to 4000 ft., and doubtless to be found all the way down to the Vega. All the birds seen were adults, but scarcely any time was devoted to looking for nests or securing specimens—the latter no easy task with a collecting-gun, as the birds were very shy.

[It was unfortunate that no specimens from these mountains were obtained, for they are practically unknown in collections (*cf.* Hartert, Vög. pal. Faun. i. p. 790).—*H. F. W.*]

Chelidon rustica. Swallow.

We omitted to make notes on the distribution of the Swallow in the Sierras. The species was breeding in numbers in the village of Grazalema (2700 ft.) and in houses below that altitude, but we found none nesting among the crags as the writer has experienced on the lower Guadiana and in Sicily.

Hirundo urbica. Martin.

San Cristobal.—Breeding colonies of the House-Martin were frequent in caverns among the cliffs from about 3000 ft. downwards on the mountain, as well as in suitable places among the "foothills." Nests were building on April 9th, and by April 26th incubation had become general among the members of a colony whose nests, in wonderful profusion, studded the sloping roof of an inaccessible cavern.

Sierra Nevada.—Quantities were nesting in the precipices from 5500 ft. down to the embouchure of the Monachil.

*Riparia rupestris (Scop.). Crag-Martin.

San Cristobal.—The Crag-Martin we found in smaller colonies than, but in much the same places as the House-Martin, the two species being often alongside one another,

in which case the former seemed to keep to itself, avoiding the House-Martins as much as space would allow ; their actions gave one the impression that they were trying to get to a quiet corner, out of the hubbub.

Sierra Nevada.—Nesting plentifully in the precipices of the Monachil, while a single pair at the desolate Peñones de San Francisco (8500 ft.) had a nest in a cave only just ready for eggs on May 2nd. In neither Sierra were the numbers so great as those of the House-Martin, and nesting seemed to be quite a fortnight later.

Apus apus. Swift.

San Cristobal.—Many Common Swifts were wheeling about the tops of an outlying spur at 4000 ft. in the forenoon of April 24th. These birds were evidently on migration. Others were seen in the Coto Doñana in the early morning of May 10th, travelling slowly northwards and apparently feeding on the way.

Apus melba. Alpine Swift.

San Cristobal.—On April 26th some eight Alpine Swifts were dashing about by the Grazalema "Choughery." There was no indication of breeding at that date—indeed, they had in all probability recently arrived, for the species had not been seen on San Cristobal during the preceding days, though some were seen at Ronda on the 22nd.

Upupa epops. Hoopoe.

The Hoopoe had an extensive range in altitude ; it was found everywhere from sea-level to 4000 ft. on San Cristobal and up to 7000 ft. in the Sierra Nevada, breeding mostly in holes in trees at the lower and among rocks at the higher elevations.

*Dryobates major hispanus (Schlüter). Spanish Great Spotted Woodpecker.

Picus major hispanus Schlüter, Falco, iv. p. 11 (1908—Seville, in Spain).

San Cristobal.—The Great Spotted Woodpecker occurred in the pinsapal up to its highest limit, but the chief resort

of the species on the mountain was lower down in the ilex zone; while the more elevated cork woods among the "foothills," such as those between Ronda and Grazalema, were, perhaps, as favourite a locality as any.

Sierra Nevada.—The timber in our district being unsuitable, the species could hardly have been expected, and was not seen.

[One specimen—a female from near San Cristobal—was obtained on March 22nd, 1910. This is much like English specimens, but the white spots on the secondaries, especially those on the outer webs, are markedly smaller than those in *D. m. major* or *D. m. anglicus*, while the crimson on the abdomen and under tail-coverts is very brilliant. The under parts are rust-coloured. The wing measures 133 mm., and the first primary is 1 mm. longer than the longest primary-coverts. The bill is short (19 mm. from nostril to tip), and is thin and tapering like that of *D. m. anglicus*, not so thick and blunt as that of *D. m. major*.—*H. F. W.*]

Cuculus canorus. Cuckoo.

The Cuckoo was heard at 6000 ft. in the Sierra Nevada on April 30th and May 1st.

Bubo bubo. Eagle-Owl.

An Eagle-Owl was heard calling in the evening of March 23rd at about 2800 ft. on San Cristobal, but the species does not seem to be a lover of great altitudes, as we never saw or found traces of it elsewhere in the Serrania de Ronda, except in the foothills, where it was not uncommon, and not at all in the Sierra Nevada.

Falco peregrinus. Peregrine.

The only Peregrine we observed in the Sierras was a single bird at the Peñones de San Francisco (8500 ft.) on May 1st.

Having spent several hours at this collection of crags, we can confidently say that it was not breeding there, and was probably engaged in hunting a pair of Red-legged Partridges which had passed with hurrying wings and disappeared in the mists a few moments earlier.

Falco tinnunculus. Kestrel.

Falco naumanni. Lesser Kestrel.

We agree with Col. Irby that certain identification of the Kestrel and Lesser Kestrel, whose distribution in these parts is much mixed, is only possible in the field at a very short range; but we felt pretty sure that a single Kestrel, seen at 7000 ft. in the Sierra Nevada on May 1st, was "*tinnunculus*," perhaps on passage *: and there were small breeding colonies of undoubted "*naumanni*" at the base of San Cristobal up to 3000 ft.; otherwise the two species were met with only at lower altitudes.

Aquila chrysaëtus. Golden Eagle.

San Cristobal.—Golden Eagles were frequently seen on the mountain, up to its summit, no doubt often the same individuals; but the species is evidently still plentiful in the higher Sierra to the exclusion of the only other rock-breeding Eagle of these parts, viz. Bonelli's Eagle, which we met with only in the foothills and lowlands.

Of the finding of a Golden Eagle's nest in a pinsapo-hung crag at 4000 ft., how the two eggs were deserted because of a futile attempt in the dusk to reach the eyrie by means of a rope, and how the eggs were eventually retrieved a month later, is described in 'Unexplored Spain.'

Sierra Nevada.—Quite a few were seen about the middle zone; in one instance a pair of Golden Eagles and a Lammergeier were soaring overhead together.

Gyps fulvus. Griffon Vulture.

San Cristobal.—The Griffon Vulture appeared to resort for nesting-purposes to the lower, rather than to the upper, regions of the Serrania, breeding colonies of Griffons being numerous from 3000 ft. downwards. Throughout the foothills, and even in the lowlands, a good proportion of the well-marked crags were tenanted.

Although associated, as a result of their feeding-habits, with mankind, one does not generally find these great birds

* Hobbies were migrating through the Coto Doñana in some numbers during the second and third weeks of May.

very familiar in their breeding-haunts; but at Arcos, a small town crowded on a wedge-shaped hill that stands out prominently among the "lowlands," there has existed from time unrecorded a large breeding colony of Griffons, the nests being in the perpendicular sides of the wedge. From the outermost houses, whose "parterres" are on the very edge of the cliff, there issues a frequent cascade of house-refuse, which, in its descent, flies past the very caves and ledges occupied by the Vultures. Not long ago a fellow-countryman who had spent a night at the Fonda complained that he had been kept awake by the "snoring of the Vultures."

The nests themselves were inaccessible without a rope, but, had it been otherwise, they would probably have remained undisturbed. The average hatching-time in our season was the middle of March, although we found one almost fresh egg on April 9th, a date, of course, abnormally late.

Sierra Nevada.—A few Griffons were evidently breeding in the lower gorges of the Monachil (3500 ft.), but we never saw them higher*.

After the Serrania de Ronda, Nevada seemed to us almost "Vultureless."

Neophron percnopterus. Egyptian Vulture.

San Cristobal.—The Neophron seemed to arrive in the "lowlands" near Jerez about March 19th †, on which date some twenty birds were seen sitting on ploughed land lying among groves of scattered ilex-trees. The foregoing remarks on the breeding distribution of the Griffon apply equally to this species: nearly all the colonies of the former species had a few pairs of the Neophron hanging about their outskirts, but the latter's less gregarious propensities (seldom more

* [A single Griffon passed over me at 6500 or 7000 ft., evidently travelling; a few minutes later a Lammergeier followed on the same course.—A. C.]

† [In other years I have noticed the Neophron in the "lowlands" (Coto Doñana) as early as *February 28th.*—A. C.]

than three or four pairs being near one another and as often as not only one) enables it to take advantage of quite small "tajos," containing perhaps only one possible ledge or hole. This, too, will account for the Neophron breeding in greater abundance in the lowlands.

Sierra Nevada.—The only two seen during our visit were at 4000 ft. The Black Vulture was never met with in either Sierra.

Gypaëtus barbatus. Lammergeier.

San Cristobal.—To observe the Lammergeier in its breeding-haunts was one of the chief objects of our visit to San Cristobal. Both in March and April we several times observed a single bird, and on March 25th saw one, through glasses at long range, enter a side-face in a precipitous, but not very large, cliff in one of the outlying spurs of the mountain (4900 ft.). On reaching the cliff, we found that the bird had left unobserved during our scramble up the very steep, broken hillside. From the tip of a projecting spur, a little above it, we could see into the nest, which was in a small cave only just sufficiently high for such a bird to stand upright at the entrance; there was a dirty platform of wool intermixed with sticks and a bone or two, but it was empty.

On April 24th we revisited the place and saw the Lammergeier several times, but the nest remained empty, and we were unable either to find an occupied nest near it, or to account for its emptiness by the suggestion that it had been robbed; since, although the "tajo" was only 60 ft. high and the nest only 20 ft. from the top and facing sideways to the general line of cliff, the nest was quite inaccessible without a rope.

This nesting site confirms the experience of others—that the Lammergeier dislikes company. No place in that neighbourhood could have been more remote from the various colonies of Vultures.

Sitting quietly one day, concealed just below the crest of

a precipitous ridge, one of these splendid birds sailed slowly by within fifteen yards of us, working along the cliff-face in a "sneaking," unobtrusive manner, as if anxious to avoid observation and perhaps also to take advantage of the air-current up the cliff-face. Every detail of its plumage was, of course, plainly visible, and it is of note that in the broad-side view (so extremely difficult to depict) the tips of the long primaries, despite their stiffness, the narrowness and lack of emargination of the web of these feathers when compared with those of a Griffon or an Eagle, shewed very considerable separation and up-curl. That these features are actually less, as would be supposed from a glance at the respective primary feathers themselves, than in the Vultures and Eagles, became apparent very soon after the bird had passed, the receding aspect being that of a long, comparatively slender, and flat-winged bird. An occasional 45° stroke of the pinions from the wrist—the forearm scarcely seemed to move, and it was lost to view round an angle of the cliff half-a-mile away.

Sierra Nevada.—We frequently saw the species in the distance, but only once at close quarters. From these observations it seemed that 4000 to 5000 ft. was probably the breeding zone; in any case, the early season at which the Lammergeier starts nesting would seem to preclude higher elevations by reason of the snow. 7000 ft. was the greatest altitude at which we saw the species, but this was evidently a travelling individual. They doubtless have to wander extensively in search of food.

Of other "Accipitres," none of which were seen at high elevations, the following gives the result of our observations as to breeding zones in these districts:—

At or near sea-level ...	Marsh and Montagu's Harriers, Booted Eagle, Spanish Imperial Eagle, Serpent-Eagle, Black and Red Kite.
From sea-level up to about 2000 ft. in the Serrania de Ronda.	Buzzard, Bonelli's Eagle, and probably Sparrow-Hawk.

Columba palumbus. Wood-Pigeon.

San Cristobal.—On March 21st flocks were seen among the ilex and the lower pinsapos, but our observations during the April visit being confined to higher elevations on this side of the mountain, we did not notice whether they remained to breed. (They nested abundantly in the Coto Doñana.)

Sierra Nevada.—Not seen.

Streptopelia turtur. Turtle-Dove.

San Cristobal.—On April 24th at 11 A.M. six migrant Turtle-Doves were resting on an esparto-grass plateau at 4000 ft.

Sierra Nevada.—Not seen.

Caccabis rufa. Red-legged Partridge.

For the complete status up to date of the Red-legged Partridge in these parts the reader should refer to 'Unexplored Spain.' The Sierra is not the true home of the species in Andalucia, and yet two pairs were seen right up among the mists and snow of the Sierra Nevada at 8500 ft., and another at the summit of the Dornajo, 7000 ft.

In San Cristobal the Red-legged Partridge was not observed above 3000 ft.

XXIV.—*Observations on the Genus* Cœreba, *together with an Annotated List of the Species.* By Percy R. Lowe, B.A., M.B., M.B.O.U.

(Plates VII. & VIII.)

I. Introductory Remarks.

The following observations are based upon the examination of some *four hundred* examples of the genus in the National Collection at South Kensington; upon *a hundred and fourteen* in my own collection; and upon *two hundred and eighty-four* in the Hon. Walter Rothschild's collection at Tring, which he was kind enough to place at my disposal.

The genus *Cœreba* (one of the typical genera of the family